

**GUIDELINES FOR PEDIATRIC
INTERFACILITY TRANSPORT PROGRAMS**

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PEDIATRIC INTERFACILITY TRANSPORT PROGRAM SUBCOMMITTEE

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Introduction

Safe and effective emergency transport of pediatric patients between health care facilities and specialized pediatric centers (e.g. Pediatric Critical Care Centers, Pediatric Trauma Centers, and Trauma Centers) is an essential component of organized systems of care for critically ill and injured children. Assuring access and appropriate linkage to such specialized centers should be part of local and regional EMS plans for children's care.

Specialized centers for neonatal and pediatric emergency and critical care have developed rapidly in California. Increasing numbers of neonates and critically ill and injured children are being transported from community health facilities, including emergency departments, to centers with specialized pediatric personnel and services. Specialized interfacility transport programs have also recently evolved to improve access to these centers and to facilitate earlier delivery of specialized critical care services. Ideally all pediatric interfacility transports should occur rapidly and safely by qualified interfacility pediatric transport programs functioning with prospectively developed operational guidelines, consultation agreements and transfer agreements.

Currently there are no uniform guidelines within the state for pediatric interfacility transport programs to assure quality of care, cost efficiency, coordination of transports, and adherence to state and federal regulations.

In 1986, a statewide California Pediatric Critical Care Coalition was formed to develop recommendations for improving services for critically ill and injured children. A committee of the Coalition developed recommendations for pediatric interfacility transport services. This committee of the Coalition was composed of members of the Advisory Committee of the Northern California Perinatal Dispatch Center, the Pediatric Intensive Care Networks of Northern and Central California and the Ad hoc Committee on Pediatric Interfacility Transport Services in California. In 1992 representatives of the Coalition's committee were appointed to the Pediatric Interfacility Transport Program Subcommittee of the California EMSC Project, who developed the attached guidelines. Earlier drafts of these guidelines were used in the Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients recently published by the American Academy of Pediatrics.



Pediatric interfacility transport programs, like other components of pediatric emergency and critical care systems, must be tailored to the special needs and resources of each region. These guidelines are intended to apply to both hospital-based and non-hospital based programs that *regularly* provide pediatric interfacility transport services. Prehospital care providers are currently involved in the interfacility transport of pediatric patients. If such transport services are rendered routinely, as part of a prehospital care provider's service plan or contract, then the provider is subject to these guidelines. Determination of the level of capability of the transporting service, whether an ambulance provider or an organized pediatric interfacility transport program, is the responsibility of the transferring and receiving physicians. When ambulance providers predominantly involved in prehospital care conduct pediatric interfacility transfers, the appropriateness of such transports and quality of care provided should be reviewed and monitored by the local EMS agency in concert with prehospital care providers.



GUIDELINES FOR PEDIATRIC INTERFACILITY TRANSPORT PROGRAMS IN CALIFORNIA

I. DEFINITIONS

Ambulance Provider. Provider of air or ground ambulances.

Medical Control Physician. The physician responsible for directing the medical care of the patient during transport.

Pediatric. The term "pediatric" includes neonates, infants, children and adolescents. For data collection purposes pediatric is defined as < 18 years.

Pediatric Interfacility Transport. The transport of ill or injured pediatric patients between health care facilities.

Pediatric Interfacility Transport Program. A transport program organized to provide pediatric interfacility transport on a regular basis. This program may be hospital-based or non-hospital-based.

Regional Interfacility Pediatric Transport Program. An organized program that provides pediatric transport services for multiple facilities in a geographic area.

Transport Team. A medical team, composed of a minimum of two individuals responsible for providing clinical care and monitoring for a patient during transport.

Transport Team Nurse. A registered nurse providing clinical care for a patient during transport.

Transport Team Physician. The physician providing clinical care for a patient during transport.



II. ORGANIZATION AND PERSONNEL

A. Administrative Director

1. Qualifications

- a. Appropriate training and experience in transport administration.

2. Responsibilities

- a. Oversight of structure, administration, operational components, fiscal management, information management and a quality improvement mechanism for the pediatric transport program.
- b. Assurance that the transport program meets all applicable federal, state and local laws and regulations. Assurance that all transport program personnel are appropriately licensed or certified in the State of California.
- c. Notification of transport team members about insurance coverage and implications of being transport team members.

B. Medical Director

1. Qualifications

- a. Completion of specialized training, experience, or expertise in pediatric and neonatal transport.
- b. Qualified specialist¹ in pediatric emergency medicine, pediatric critical care or neonatal-perinatal medicine.

¹qualified specialist means a physician and surgeon licensed in California who has taken special postgraduate medical training, or has met other specified requirements, and has become sub-board certified within six (6) years of qualification for sub-board certification in the corresponding subspecialty.



2. Responsibilities

- a. Concurrent service as administrative director if individual meets qualifications in B(1) a.
- b. Authority over transport utilization, including triage of transport requests when transport demand exceeds operational capacity.
- c. Coordination of specialists and services required in the transport of patients.
- d. Establishment of guidelines for transport team composition and mode of transportation.
- e. Appointment and assurance of competence of medical control physicians and transport team physicians and the development of appropriate orientation, training, and continuing education programs for these physicians.
- f. Appointment of associate and/or assistant medical director(s) as necessary.
 - (1) The associate and assistant medical director(s) should have specialized training, experience and expertise in pediatric transport and pediatric critical care, including advanced skills in monitoring and life support techniques.
 - (2) In the absence of the medical director, an associate or assistant medical director should be designated to function as medical director.

C. Nursing Director

1. Qualifications

- a. Registered nurse with a baccalaureate degree in nursing or another health related field.
- b. Specialized training and at least 2 years of clinical experience in pediatric transport.



- c. Advanced skills and knowledge of the standards of practice in pediatric monitoring and life support techniques and a minimum of 3 years of clinical experience in pediatric critical care, neonatal intensive care or pediatric emergency services.

2. Responsibilities

- a. Concurrent service as the administrative director if individual meets qualifications on B(1)a.
- b. Appointment and assurance of competence of transport nurses and development of appropriate orientation, training and continuing education programs for these nurses.

D. Joint Responsibilities of the Administrative, Medical and Nursing Directors

- 1. Collaborative responsibilities of the administrative, medical and nursing directors include, but are not limited to, the following:
 - a. Implementation of these guidelines for the pediatric interfacility transport program.
 - b. Development, implementation and annual review of policies, protocols and standards for the transport program including policies and procedures for patient care.
 - c. Collection and analysis of data necessary for evaluation of the safety and effectiveness of the transport program.
 - d. Integration of orientation, training and continuing education programs for personnel involved in the transport program.
 - e. Selection and periodic evaluation of competency and performance of personnel involved in the transport program.
 - f. Implementation of an organized quality improvement program, including the review of quality of care provided by the transport program and appropriate utilization of the transport program and its resources.



- g. Development of the budget.
- h. Appropriate interface with the local EMS agency.
- i. Periodic review of transactions of individual transports.
- j. Development of outreach education related to the pediatric interfacility transport program.

E. Medical Control Physician

1. Qualifications

- a. Qualified specialist (see footnote 1 on page 9), in at least one of the following: pediatrics, pediatric emergency medicine, emergency medicine or anesthesiology.
- b. 2 years of clinical experience in pediatric transport.
- c. Expertise in pediatric critical care, neonatal intensive care or pediatric emergency medicine.

2. Responsibilities

- a. Oversight of medical care delivered during individual transports.
- b. Attendance at regular meetings of the transport program staff concerning policies and procedures, quality improvement and safety.
- c. Immediate availability when on call for consultations and communication with transport team and referral sources.²
- d. Verification of acceptance and disposition of the patient.
- e. Determination of the transport team composition, the mode of transport and direction of the clinical care for an individual transport.
- f. Delegation of specific responsibilities for the medical care of an individual patient to another physician who has special training in the medical care required; however, the medical control physician retains

²immediately available means (a) unencumbered by conflicting duties or responsibilities; and (b) responding without delay when notified.



overall medical responsibility for the transport.

F. Transport Team Personnel

1. Qualifications

- a. For the transport of neonatal and pediatric patients deemed critical by the referring and receiving physicians the transport team should consist of at least 2 individuals and at least one of the team members should be a transport nurse or physician.
- b. Certification as a physician, registered nurse, respiratory care practitioner, EMT-I, EMT-II or paramedic as determined appropriate by the medical control physician.
- c. Training and experience in pediatric transport and pediatric or neonatal critical care.
- d. Transport team personnel who are responsible for the stabilization and transport of ill or injured pediatric patients should collectively possess the skills and knowledge to provide a level of care commensurate with the specific and anticipated clinical needs of the patient.

2. Responsibilities

- a. Stabilization and care during transport of ill or injured pediatric patients.
- b. The transport team leader should:
 - (1) Be assigned by the medical control physician for each transport team.
 - (2) Be responsible for patient care under the direction of the medical control physician.
 - (3) Coordinate, supervise and/or participate in the patient care delivered.
 - (4) Maintain communications with the medical control physician and the receiving and referring health care personnel.



- (5) Be responsible for obtaining consents required for the transport and for admission to the receiving hospital.
- (6) Attend formal orientation and education programs as required by the transport program.
- (7) The transport team should be able to depart from the transport program facility within 60 minutes when the medical control physician deems it to be necessary. Mobilization time is measured from the time of the agreement to transport the patient to the time of the team's departure.

G. Communication Center

1. The Pediatric Interfacility Transport Program should have a transport communication center or special location where transport requests are received and processed. The essential components are:
 - a. Designated phone lines and two-way communication capability;
 - b. Transport protocols;
 - c. A reference data base on hospitals and ambulance providers; and
 - d. Mechanism of documenting all transport transactions.
2. Communication personnel should be trained and skilled in handling transport transactions. They should not have other duties of more primary importance that might cause delays in the transport process.
3. All communications for individual transports should be documented.
4. A reference data base should be maintained and should include regional information pertinent to pediatric interfacility transport, including hospitals, ambulance providers, airports, interfacility distances, interfacility transport times by the various ambulance providers, and other essential information stored in a manner which allows immediate accessibility.
5. The transport program should provide a communications system that facilitates communications between the transport team, the communication center personnel, the medical control physician, the referring and receiving facilities, and the ambulance providers.



III. CONSULTATION SERVICES

Medical and nursing consultation services should be provided by Pediatric Interfacility Transport Programs. Consultation should be available at all times to health care personnel wishing information concerning the care of pediatric patients who might need interfacility transport.

IV. OPERATIONS AGREEMENTS WITH AMBULANCE PROVIDERS

A. The Pediatric Interfacility Transport Program should have written operations agreements with ground and air ambulance providers used by the program for emergency and/or elective transports. Agreements should be in place prior to the initiation of the utilizations of an ambulance provider. Agreements should include but not be limited to:

1. Responsibilities for patient care;
2. Recording and transferring appropriate information and records;
3. Financial and indemnification provision; and
4. Term of agreement.

B. The Pediatric Interfacility Transport Program should be responsible for assuring the coordination of ambulance services.

V. AFFILIATED HOSPITAL AGREEMENTS

A. Pediatric Interfacility Transport Programs should have written agreements with referring and receiving hospitals that routinely utilize the program.

B. Agreements should specify the roles and responsibilities of the transport program and the hospitals including:

1. Agreement to transfer and receive appropriate pediatric patients when indicated.



2. Policies and procedures for evaluating, transferring or receiving pediatric patients.
 3. Responsibilities for patient care before, during, and after transport.
 4. Private physician and family involvement.
 5. Recording and transferring appropriate information and records.
 6. Financial and indemnification provisions.
 7. Term of agreement.
- C. Agreements should include provisions for educational programs related to pediatric transport, evaluation and stabilization of critically ill and injured pediatric patients, and availability of pediatric critical care consultation and other pediatric critical care services.

VI. CONTINUOUS QUALITY IMPROVEMENT PROGRAM

- A. The Pediatric Interfacility Transport Program should have an organized multidisciplinary quality improvement program.
- B. Components of the plan must include an interface with the prehospital, emergency department, trauma, inpatient pediatrics, and pediatric critical care quality improvement activities.
- C. The quality improvement program should utilize concurrent review, generic screens and focused studies to monitor pediatric care provided by the Pediatric Interfacility Transport Program.
- D. The quality improvement program should:
1. Establish, maintain, support and document evidence of a planned, systematic quality improvement program.
 2. Assure appropriate and adequate response to findings from quality



improvement activities, including the identification of opportunities to improve patient care and pediatric transport program.

3. Assure appropriate and efficient use of the transport programs and resources.

E. The quality improvement program should address the following:

1. Safety

- a. Patient safety for transport under the circumstances.
- b. Transport team safety and fitness, including flight arrangements, safety restraints.
- c. Equipment safety, including records of equipment used, maintenance, and testing of function.
- d. Untoward events

2. Expediency

Recording and review of response times for each component of the transport program.

3. Resource allocation and cost-effectiveness

- a. Monitoring and review of appropriate utilization of the transport program, transport personnel, equipment, supplies, and mode of transport.
- b. Monitoring and review of transport costs and cost-effectiveness.

4. Triage

Evaluation of the flow of information, prioritization of resource allocation, selection of ambulance provider, and selection of receiving facility.

5. Patient Care and Management



Evaluation of patient care and management in terms of patient outcome.

VII. INFORMATION MANAGEMENT

- A. Accurate and current records should be maintained on all components of the Pediatric Interfacility Transport Program.
- B. Where available, centralized data centers should receive data from each transport program.
- C. Data should be collected and reviewed on a regular basis for planning, evaluation and quality improvement.
- D. Cooperation should exist between programs in the development, analysis and distribution of data.

VIII. PEDIATRIC INTERFACILITY TRANSPORT EQUIPMENT AND SUPPLIES

- A. The following equipment and supplies should be available and maintained in proper operating condition for use by the Pediatric Interfacility Transport Program.
 - 1. Transport isolette
 - a. Transport isolette should be capable of providing a neutral thermal environment and should allow for continuous intensive care at all times.
 - b. The transport gurney or isolette should be capable of being loaded into an ambulance by the ambulance personnel and safely secured within the ambulances.
 - 2. Portable patient equipment
 - a. Portable patient monitoring equipment should be capable of monitoring the patient's heart rate, respiratory rate, blood pressure, blood oxygenation and temperature in a moving environment.



- b. Transport equipment should have an independent battery power capability of at least 1 1/2 hours.
- 3. Transport oxygen/air systems
 - a. The primary oxygen/air system for transport isolettes should have the capability of blending air and oxygen and providing a precise oxygen concentration from 21% to 100%.
 - b. Oxygen/air systems should have the capability to operate for twice the anticipated duration of the transport as estimated by the transport program.
- 4. Ambulance Power
 - a. Inverter adequate to power the transport equipment.
 - b. Built-in suction.
- 5. Power and oxygen/air connections
 - a. The transport equipment system should be capable of direct connection to ambulance oxygen/air and power supplies.
 - (1) 50 PSI oxygen/air source.
 - (2) Standard oxygen and air connections.
 - (3) Standard oxygen/air flow meter, capable of delivery of up to 15 liters/minute.
- 6. Means of securing equipment
 - a. Positive attachments for all of its components.
 - b. The transport equipment should be stressed and secured such that it will maintain physical and functional integrity when subjected to an impact deceleration.



7. Dedicated equipment and supplies

- a. All medical supplies, medications and equipment used on a regular basis by the transport program should be dedicated to it. (See Appendix I.)

B. Operation and Maintenance

1. All medical equipment and supplies should meet applicable federal and state requirements, including FAA hazardous material regulations.
2. All equipment should be maintained in working order and be ready for use on transport.
3. Medical equipment, supplies and medications shall be checked on a regular basis and prior to each transport and be compatible with each other and with the equipment of the surface and air ambulance.



APPENDIX A (ATTACHMENT)

The following equipment, medication and supplies should be stocked and immediately available for transport. Selection for the individual transport should be based on the patient's needs as determined by the medical control physician and the referring physician.

a. Monitoring Equipment

1. Stethoscope
2. Cardiac-respiratory monitor
3. Pulse oximeter
4. Blood pressure cuffs (automatic and manual) neonatal, infant, child, and adult
5. Patient thermometer
6. ECG monitor/defibrillator (5-400 J capacity) with pediatric and adult sized paddles.
7. Inspired oxygen monitor

b. Respiratory Equipment

1. Oxygen delivery (50 psi with alarm system)
2. Flowmeter-15 L/minute
3. Neonatal ventilator; pediatric ventilator optional
4. Access to high PEEP system
5. Bag valve mask (BVM) device, self inflating (neonatal, pediatric size 450 ml and adult size 1000 ml).
6. Clear face masks (infant, child, adult)
7. Laryngoscope, blades, (curved 2,3; straight 0,1,2,3), light bulbs and batteries
8. Endotracheal tubes (uncuffed 2.5-5.5 and cuffed 6.0-9.0)
9. Magill forceps (pediatric and adult)
10. Endotracheal tube stylettes (pediatric and adult)
11. Oral airways (0-5)
12. Chest tubes, placement equipment and Heimlich valve



13. Portable air and oxygen cylinders
14. Nebulizer
15. Suction:
 - a) Bulb syringe
 - b) Portable suction
16. Suction catheters (tracheal and pharyngeal) (infant, child, adult)
17. Feeding tubes (5, 8, 10 Fr)
18. Nasopharyngeal airways (infant, child, adult)
19. Oxygen delivery devices (i.e. nasal cannulas and oxygen masks)
20. Nasogastric tubes (infant, child, adult)

c) Other Equipment

1. Adhesive tape
2. Arterial line maintenance system
3. Urinary bladder catheters (infant, child, adult)
4. Vascular access:
 - a) catheters
 - b) tubing
 - c) intraosseous needles
 - d) central line
 - e) UAC/UVC catheters and placement equipment
5. Infusion pumps
6. Blood culture tubes
7. Penlight/flashlight
8. Warming devices, insulated blanket
9. Child restraint devices for isolette and gurney

d) Medications



1. Pulmonary
 - a) Aminophylline
 - b) Bronchodilators - aerosol
 - c) Racemic epinephrine
 - d) Steroids
2. Cardiac
 - a) Adenosine
 - b) Atropine
 - c) Bretylium
 - d) Calcium Chloride
 - e) Diuretic
 - f) Dobutamine
 - g) Dopamine
 - h) Epinephrine
 - i) Lidocaine
 - j) Prostaglandin
 - k) Sodium bicarbonate
 - l) Vasodilators
3. Neurologic
 - a) Anticonvulsants - short and long acting
 - b) Mannitol
 - c) Muscle relaxants
 - d) Naloxone
 - e) Opiate
 - f) Sedative
4. Other Medications



- a) Balanced salt solutions
- b) Broad spectrum antibiotics
- c) Colloids
- d) 50% Dextrose
- e) Diphenhydramine
- f) IV solution with dextrose and saline



Suggested Reading.

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